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THE PLANT DISEASE REPORTER

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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SURVEY OF MICROFLORA OF WHEAT SEED FROM MINNESOTA, NORTH DAKOTA, AND SOUTH DAKOTA

Ian W. Tervet

Relatively few samples of wheat were examined, since J. J. Christensen of the University of Minnesota and E. W. Hanson of the U.S. Bureau of Plant Industry, Soils, and Agricultural Engineering were conducting an extensive survey of the fungi associated with wheat seed. Through the courtesy of these men, the data for Minnesota, North Dakota, and South Dakota were made available to the writer, a summary of their information following.

Table 1. Microflora of wheat seed from the 1943 crop in Minnesota and the Dakotas

Location of seed lots	No. of varieties	Average (upper figure) and range of (lower figure) percent of seeds infected with fungi				
		Helminthosporium spp.	Fusarium spp.[a]	Alternaria sp.	Miscellaneous[b]	Sterile
Minnesota						
Crookston	7	32	2	59.5	5.6	8.2
		17-68	0-7	24-74		0.5-25
Duluth	3	31.6	4.6	59	6.8	4.6
		26-39	3-8	54-65		3-8
Grand Rapids	3	23.3	4	68.3	7.6	2.6
		18-34	1-8	64-71		2-4
Morris	7	30.9	11.9	52.7	6.8	6.4
		13-74	2-19	16-65		1-15
St. Paul	6	52.6	4.1	38.1	6.4	6.8
		31-63	1-13	28-44		2-24
Waseca	5	34	19.2	44	6.6	4.8
		22-51	9-27	25-58		0-16
North Dakota						
Fargo	12	22.2	5	66.2	5.8	7.4
		8.5-34	1.5-8.5	55-81		0-19
South Dakota						
Brookings	4	8.2	58.3	43.7	12.4	0.03
		7-10	49-67.5	32-52.5		0-0.5

[a] Includes *Gibberella saubinetii* [*G. zeae*]

[b] Includes bacteria and multiple infections on seeds.

Table 2. Microflora of 1943 wheat seed from localities in South Dakota.

Variety	Location	Per cent seeds infected with fungi: Helminthosporium	Gibberella	Fusarium	Alternaria & Miscellaneous	Sterile
Thatcher	Brookings	0	20	1	76	3
Ceres	"	2	30	0	68	0
Regent	"	0	74	1	25	0
Haynes Bluestem	"	2	16	0	82	0
Ceres	Huron	4	2	4	84	6
Ceres	Highmore	4	0	2	62	32
Regent	"	4	0	0	66	30
Haynes Bluestem	"	2	0	6	52	40

Table 3. Microflora of 1943 wheat seed from Yellow Medicine County, Minnesota.

Variety	Soil preparation	Per cent seeds infected with fungi: Helminthosporium[a]	Gibberella	Fusarium	Alternaria & Miscellaneous	Sterile
Thatcher	Corn---disked	20	36	2	42	0
"	" ploughed	52[b]	38[b]	1	14	0
"	" "	28	47[b]	3	22	0
Rival	" "	31[b]	24[b]	1	44	1
"	" "	60[b]	27[b]	1	16	3
Winter Wheat		29	10	6	55	0

[a] Principally Helminthosporium sativum, but a few Brachysporium and Helminthosporium N included.

[b] Several seeds gave rise to both Helminthosporium and Gibberella.

Seed samples from 6 localities in Minnesota comprising 31 seed lots of several varieties of spring wheat, from Fargo, North Dakota (comprising 12 varieties) and from Brookings, South Dakota (4 varieties) were plated on acid potato-dextrose agar after surface sterilization of the seeds with mercuric chloride and sodium hypochlorite disinfectants. Helminthosporium spp. were the most common pathogenic fungi on wheat seed, with the samples from St. Paul, Minnesota having the highest average infection, 52.6%, and the samples from Brookings, South Dakota having the lowest average, 8.2%. Kubanka from Morris was most heavily infected with Helminthosporium, 74% of the seeds giving rise to this fungus. In general, Marquis had the lowest reading for Helminthosporium. The highest infection of Fusarium spp. principally Gibberella saubinetii [G. zeae] in southern Minnesota and South Dakota occurred on the samples from Brookings, South Dakota where 58.3% of

the seeds were infected. In Minnesota the Waseca samples had most Fusarium, 19.2%, with the varieties Regent and Thatcher being most susceptible (Table 1).

The samples examined by the writer included 14 lots of wheat from 2 sources. One series was obtained from W. F. Buchholtz of South Dakota State College and consisted of varieties from 3 localities in South Dakota. The second series was obtained from R. C. Rose of the University of Minnesota and consisted of samples from Yellow Medicine County.

Very heavy scab infection occurred on the samples from Brookings, the highest infection, 74%, being on Regent, with Haynes Bluestem having least, 16%. Little Helminthosporium was seen on the South Dakota samples. Scab infection decreased on the samples grown west of Brookings. At Huron, Ceres had 2% scab, while at Highmore, none of the 3 varieties examined had any scab although a few seeds were infected with other Fusarium spp. (Table 2).

The spring wheat samples from Yellow Medicine County were infected heavily with Gibberella. Thatcher had more scab than Rival, and the winter wheat sample had least scab. Infection with Helminthosporium ranged from a low of 20% on one Thatcher sample to a high of 60% on Rival (Table 3).

Summary. Scab on spring wheat was heaviest in southern Minnesota and eastern South Dakota. In general, seeds tended to carry more Helminthosporium than Gibberella except in eastern South Dakota where scab appeared to be especially severe.

EMERGENCY PLANT DISEASE PREVENTION PROJECT.

FLAX DISEASE SURVEY IN MINNESOTA AND NORTH DAKOTA

H. H. Flor

Dr. Ian W. Tervet and I conducted a flax disease survey on June 20 to 24, inclusive. Our route was up the valley to Fairmount, North Dakota, and then southeast to Morris, Minnesota, where we examined the station plots. We returned to Fargo via a region northeast of Morris in which a large acreage of flax is grown. On the 22d we drove down the Red River Valley to Grand Forks, North Dakota, and then over to Crookston, Minnesota to examine the plots at that station. From Crookston our route lay through Red Lake Falls and Warren, Minnesota, Grafton and Park River, North Dakota, and back to Fargo. The territory covered was not so extensive as I had hoped for but considerable time was spent locating fields of Crystal flax. Several reports of poor stands had been received from farmers growing this new variety. The previous week Dr. Tervet had covered parts of central and western North Dakota and observed flax to be in excellent condition with little disease evident.

The decrease in flax acreage compared with that of 1943 was particularly noticeable. Except in a few localities, where flax continued to be grown throughout the 1930's, there appeared to be a sharp reduction. We saw only 3 fields of flax between Fargo and Grand Forks.

In the region north of Fargo, much of the flax was sown late again this year so that it was just emerging in many fields at the time of the survey. The late-sown flax was highly chlorotic in most fields, probably due to the preceding cool, wet period. Early-sown fields were in bloom and generally of good color, even when adjacent to later-sown chlorotic fields.

Reports of thin stands of Crystal flax were verified by the condition of several fields near Morris. These fields had been sown early and had been subjected to 8 or 10° frost. The seed from the 1943 increase field of Crystal at Morris was of mediocre quality and farmers had been advised to sow 40 pounds per acre. Consequently, it is not clear whether the poor stands were due to frost, weak germination, or seedling blight. Leaf lesions, apparently caused by Colletotrichum lini, the seedling blight organism, were present but not in epidemic form. Stands of Bison and Biwing were better than those of Crystal in the Morris area.

No report of thin stand in Crystal had been received at the Crookston Station and satisfactory stands were observed in fields of this variety near Red Lake Falls and Warren. At Warren, a late field of Crystal sown with seed from Morris had a satisfactory stand but there was appreciably more seedling blight (less than 1%) than a field sown with the Crookston seed.

Rust, Melampsora lini, was present on susceptible varieties throughout the territory but in only one field of Bison, near Wheaton, Minnesota, was it sufficiently abundant to cause appreciable loss. Only a trace of rust was present at the Morris station and in fields of Biwing east of Morris. Rust-immune varieties have largely replaced Bison in the region north of Fargo. A trace of rust was found on Bison at the Crookston station and on Bison, Biwing, Royal, Redson, Redwing, Koto, C.I. 1081, and C.I. 1082 at Park River.

No rust was observed in a field of Koto near Nash, North Dakota.

Seedling blight, Colletotrichum lini, was present in many fields. It was most conspicuous as a spot of cotyledons and the older, lower leaves of the plants. It appeared to be especially abundant in Royal flax at the Morris station and in a field of Victory near Grafton. How much this disease had contributed to thin stands was difficult to estimate as infected plants are often killed before they emerge and the seedlings killed after emergence disintegrate rapidly.

Pasmo, Mycosphaerella linorum, was present in the few fields of Viking (Golden) observed, and was isolated from leaf lesions in one field of Victory. This is a disease primarily of maturing plants so this survey was made too early to determine its importance.

Browning, Polyspora lini, was not observed on the survey. Bison, considered to be the most susceptible of our standard varieties to this disease, has almost ceased to be grown in the territory covered by the survey.

Wilt, Fusarium lini, was observed in fields of Royal and the Argentine importation made a few years ago at Nash, North Dakota. One to three percent of the plants in some fields were dead or dying so that loss as yet was not appreciable.

DIVISION OF CEREAL CROPS AND DISEASES.

CEREAL SMUT SURVEY IN NEBRASKA

Stuart M. Pady

From July 11-23 a trip was made through the entire grain growing area of Nebraska in a continuation of the cereal disease survey with particular attention being paid to the prevalence and severity of the cereal smuts. This report concerns itself only with that phase of the survey, and the

other cereal diseases observed will be reported later. The trip was made in company with Mr. M. E. Yount of the Barberry Eradication Office, Lincoln. In each of the 35 counties visited an attempt was made to obtain readings from many fields lying in different parts of the county. Particular attention was paid to the western part of the State because of reports of bunt from that area.

Winter Wheat. In all, 182 fields of winter wheat were examined. These were distributed over 31 counties and the acreage was approximately 13,000. The wheat in the southern part of the state was mature and was being combined as far north as Keith County. In general from this point west and north the wheat was in the medium to hard dough stage with some fields still in the soft dough.

Bunt. The most serious smut observed was bunt or stinking smut (Tilletia sp.). It was found to be widely spread and apparently well established in the northwestern part of the State. In 52 fields representing 2200 acres in 9 counties bunt ranged from a trace to 60%, with an average of 7.6%. The seriousness of this disease is evident when it is realized that 66% of all fields examined (78) in these 9 counties were infected.

The following table summarizes the data on bunt on winter wheat.

Table 1. Bunt on winter wheat in Nebraska

County	Number fields examined	Number fields infected	Average percent	Maximum percent
Kimball	3	1	tr	tr
Banner	8	2	tr	1
Morrill	6	2	9	17
Scotts Bluff	7	7	9	20
Box Butte	12	8	9	60
Dawes	15	9	11	35
Sioux	3	3	21	33
Sheridan	21	17	5	35
Cherry	3	3	15	25
Total	78	52	7.6	

Examination of some of the collected material indicates that the species is T. foetida (Wallr.) Liro and it is probable that bunt in the majority of the fields, if not all, is of this species.

Loose Smut (Ustilago tritici) was found in 49 of the 182 wheat fields examined, ranging in amount from a trace to 8%, averaging less than 1%. Thirty-one of the fields were described as a trace. Since most of the fields were mature it was difficult to find the smutted heads and this figure is probably low. Loose smut was not confined to any one area but was rather generally scattered over the State, as indicated by its distribution in the following counties: Cuming (3%), Washington (tr, tr), Cass (tr, tr, 1%), Hamilton (1%), Adams (tr, tr), Webster (tr, tr), Kearney (tr), Franklin (tr, 2%), Harlan (tr, 1%, tr, 2%), Phelps (tr), Frontier (tr), Hitchcock (tr), Chase (1%, 2%, tr, tr), Perkins (tr, tr, tr, 1%), Lincoln (2%, 1%, tr), Keith (2%), Deuel (5%, tr), Kimball (tr), Banner (tr, tr),

Box Butte (tr, tr, tr, tr), Sioux (8%), Sheridan (tr, 1%), Cherry (tr, tr), Boyd (tr).

Spring Wheat. Along the northern part of the State spring wheat is grown and 22 fields (980 acres) were examined in 9 of the northern counties.

Bunt (Tilletia sp.) was found in 8 fields (340 acres) in 3 counties, ranging from a trace to 10%, and averaging 1.1%. The following table summarizes the information on this disease.

Table 2. Bunt in spring wheat in Nebraska

County	Number fields examined	Number fields infected	Average percent	Maximum Percent
Box Butte	7	3	tr	tr
Sioux	3	1	tr	tr
Sheridan	6	4	3	10
Total	16	8	1.1	

Loose smut (Ustilago tritici) was observed in 5 fields, in Box Butte County (3%), Sioux County (4%, 1%) Sheridan County (5%), and Boyd County (tr) and the average infection was 3%.

Oats. Oats were generally distributed over the State and 56 fields (1850 acres) were examined in 30 counties. In northeastern Nebraska most of the oats are being harvested, while in the western part of the State most fields are still green.

Smut (Ustilago sp.) was found in about half (30) of the fields in 21 counties, averaging 2.5%. The northeast counties appear to have somewhat more smut, 12 fields averaging 3% in the following counties: Douglas (12%), Saunders (2%), Washington (3%), Cuming (tr, 1%), Stanton (tr), Wayne (5%, 1%), Dixon (2%), Cedar (1%, 10%), Knox (10%).

In the western counties smut was found in the following counties; Frontier (2%), Hitchcock (3%), Perkins (tr), Keith (tr), Cheyenne (1%), Kimball (1%), Banner (tr, tr), Morrill (tr), Dawes (2%, tr, tr, tr), Sheridan (1%, 2%), Cherry (1%, tr).

Barley. The 29 barley fields (720 acres) examined were in 18 counties with most of the fields being in south-central and northeastern Nebraska. In this latter area the barley acreage is greatly reduced over last year.

Smut (Ustilago nuda and U. hordei) was found in 24 of the 29 fields. The range of infection was from a trace to 12%, averaging 5%. In the following counties the total smut percentage is given for each field followed by the percentages of loose (L) and covered (c) smut where they were obtained: Adams 4 (3L, 1c), Webster 3 (1L, 2c), Franklin 10, Harlan 10, 8, 6 (L), Hitchcock tr, tr, Perkins 12, Frontier 1, 4 (3L, 1c), Deuel tr (c), 2 (1L, 1c), Cheyenne 1 (L), Banner 3 (c), Dawes 10 (1L, 9c), 4 (3L, 1c), 2 (L), Keya Paha 2 (c), Boyd 5 (L), Knox tr, 1, Dixon tr, Wayne 10 (L).

EMERGENCY PLANT DISEASE PREVENTION PROJECT

STEM RUST OF WHEAT IN THE DAKOTAS, WITH NOTES ON OTHER WHEAT DISEASES.

Ian W. Tervet

During the period July 19 to July 24, wheat was examined in the territory from Brookings, South Dakota, to Watertown, west to Ipswich, south to Chamberlain, west to Rapid City and then north to Bowman and Dickinson, North Dakota and east to Fargo.

Stem Rust (Puccinia graminis var. tritici). Northeastern and north-central South Dakota. On July 19 and 20, most wheat from Brookings to Ipswich was in late milk to early dough. Most of the wheat was Rival with some Pilot and a little Thatcher. Stem rust was found in all fields of Rival and Pilot but none was found on Thatcher. Rust prevalence on the resistant wheat, Rival, varied from 0 to 60%, average 15%, and severity in most cases was a trace to 1%. However the infection in fields was variable, some stems having 5 to 10% infection while in others single pustules only were found. The pustules themselves in most cases were large. It is difficult to forecast the future development of stem rust on Rival but should the rust be capable of further development it is quite possible that Rival will suffer appreciable loss.

South-central and Southwestern South Dakota, July 20 and 21. In the south-central section from Miller to Chamberlain and vicinity, most of the spring wheat is Ceres, with resistant varieties such as Rival, being grown only in the area near Miller. In Lyman County, rust-susceptible winter wheats are grown extensively. The spring wheat in this territory is almost entirely Ceres. Winter wheat was in hard dough to ripe, while the spring wheat was variable, a few fields being in early milk while others were in mid-dough. Stem rust was very heavy in all fields of winter wheat. Loss from stem rust varied, some fields having ripened sufficiently early to avoid serious reduction in yield, but any field where the grain was slow to ripen was severely injured. In southern Lyman County, loss from stem rust was heaviest, while winter wheat in the northern part of the same county escaped damage to a large extent. Much of the Ceres wheat will suffer heavy loss from stem rust, and in some fields, where the plants on July 21 were in early milk, little grain can be expected.

From Lyman County west to the Black Hills, most of the wheat is Ceres, with fields of Marquis occurring in Pennington County and in the other counties of the Black Hills region. Wheat was in the flowering to milk stage on July 21 and 22 in the Black Hills region. Stem rust was found in every field and there is every likelihood that loss from stem rust will be very severe, possibly around 50%.

Western South Dakota and Southwestern North Dakota, July 22 and 23. From Newell, South Dakota north to Bowman, North Dakota relatively little wheat is grown. Ceres and Marquis were the only varieties seen and stem rust was abundant in every field. From Newell to Buffalo, South Dakota most fields were in the late milk to early dough stages but stem rust was sufficiently developed to cause serious damage. In Bowman County, North Dakota planting was delayed this spring because of heavy snow cover and most wheat in this section was from flowering to early milk. While stem rust was not so severe as further south, the lateness of the wheat will permit plenty of time for heavy infection to occur and substantial loss from stem rust can

be expected on Ceres and Marquis. At Bowman, demonstration plots of 5 stem rust resistant wheats (Regent, Mida, Rival, Vesta, and Pilot 13) were examined. Stem rust was found only on Rival and Pilot, prevalence and severity being a trace for each variety. Adjacent fields of Ceres and Marquis had all plants infected and the severity in these fields would average 10%.

Western North Dakota to Red River Valley. From Bowman north to Dickinson and from there east through Mandan to Fargo, stem-rust-resistant varieties are grown. Stem rust in this area is at the present time of little importance, although pustules can be found in most fields of Rival. Somewhat heavier infections occurred on Rival in the vicinity of Mandan than at other points east and west of that town. At Mandan pustules were emerging on the necks of Rival wheat plants and such infected plants undoubtedly are being injured by the rust. Up to 60% of Rival plants in fields in the Missouri Valley near Mandan were infected. Eastwards from Mandan to Fargo, stem rust on Rival was lighter, prevalence usually not exceeding 25% with severity trace to 1%. Other resistant wheat varieties (Thatcher, Regent, and Pilot) were not injured by stem rust.

Other diseases on wheat. Apart from stem rust several other diseases are prevalent on wheat. Leaf Rust (Puccinia triticina) [P. rubigo-vera var. tritici] is present in epidemic proportions in every field examined, even the more leaf-rust-resistant varieties being heavily attacked this year. Black streaks commonly occur on the stems of Rival and Black Chaff is common on the glumes. Most of the blackening of the glumes appears to be physiologic in origin and is not of necessity associated with Phytomonas translucens var. undulosa [Xanthomonas translucens f. sp. undulosa]. Root rot (cause not definitely determined but probably associated with Helminthosporium spp.) is causing premature ripening in many of the fields especially in western North Dakota. Patches of light-coloured heads can be seen in most fields, as high as 25% of the area in some fields being affected. Grain from these prematurely ripened heads is shrivelled and loss from root rot is unusually heavy.

E ERGENCY PLANT DISEASE PREVENTION PROJECT

GENERAL REMARKS IN THE SURVEY REPORTS

Many of the survey reports contain statements applicable to most or all of the crops examined, such as descriptions of weather or other conditions affecting plants, explanations of the area included in the survey, mention of other persons taking part, etc. To avoid excessive repetition, these general statements are given here and should be read in connection with the individual crop reports from these States. The statements are from reports on Emergency Plant Disease Prevention Project surveys.

WEATHER CONDITIONS AFFECTING CROPS IN MASSACHUSETTS: Drought conditions were becoming critical in Plymouth County the last week of July. The early potato crop will be cut short. Most vegetables have approached or are approaching the serious wilting point. Without rain in the near future apples and peaches will not size. Late vegetables are not being planted because of the dry soil conditions. At the present time there are no disease problems of consequence. Conditions have been more favorable for insects than diseases. Aphis control, especially on potato and tomato, is

a problem. One 20-acre apple orchard in Lakeville was heavily infested with the European red mite.

It is assumed that conditions in Bristol County are about the same as for Plymouth County. While it is too dry for good plant growth in Middlesex and Worcester Counties, crops there are not suffering as they are farther south in New England. In the Connecticut River Valley of Hampshire and Franklin Counties rainfall has been ample during the latter part of June and July. The Valley will enter August with prospects of good crops, following the short onion harvest due to May and early June drought. -- Robert C. Cassell, July 24-29.

ARSENIC BURN AND FERTILIZER INJURY AGGRAVATED BY HOT WEATHER IN SOUTHERN NEW ENGLAND: The serious spring and summer drought and recent hot weather in Connecticut and Rhode Island has apparently been conducive to arsenic burn of apple and peach leaves. Where hill and row fertilization is practiced considerable fertilizer injury to potatoes and vegetables in general has resulted. Drought has been serious enough in limited areas of southern Connecticut to kill the tops of potatoes while the tubers are hardly 1/3 developed. Some vegetable crops have suffered equally as much damage. -- Robert C. Cassell, July 10-12.

WEATHER CONDITIONS IN WESTERN NEW YORK VEGETABLE-GROWING REGIONS: During the period July 24-28, a preliminary plant disease survey was made through the principal vegetable-growing regions of Western New York, including sections of Monroe, Orleans, Niagara, Erie, and Chautauqua Counties. The writer was accompanied by Dr. Charles Chupp, of the New York State College of Agriculture.

The month of July has been generally very dry throughout this area, with only local areas receiving adequate moisture. This is in marked contrast to the earlier part of the season, which was so rainy. In the vicinity of Rochester a hail storm had lately done severe but very localized damage. Some fields directly in the path of the storm are a total loss. -- John S. Niederhauser.

AREA SURVEYED IN THE NEW JERSEY-DELAWARE-MARYLAND AREA: During the week of May 15 to 20, visits were made to farms in Anne Arundel County in Eastern Maryland, Queen Annes and Kent Counties on the Maryland Eastern Shore, Kent and New Castle Counties in Delaware, and Cumberland, Gloucester, and Camden Counties in southwestern New Jersey. -- E. A. Walker

DROUGHT IN MISSISSIPPI: An extended trip was made throughout the entire State during the period July 17-26. Crops, corn in particular are suffering more from drought than anything else. Judging from the appearance of the crops, the area between Tupelo and Meridian seems to have had more rainfall than any other section of the State. -- Douglas C. Bain.

DROUGHT CONDITIONS IN OHIO: Crops over much of southern, contral, and locally in northern Ohio are being damaged by drought conditions. The damage varies considerably from one locality to another depending upon how many local thunder showers have fallen during the past month. In areas most deficient in rainfall the oat crop was short and a few fields were seen which were not harvested. Corn on poorer soils is definitely injured. A number of fields were seen where more than half of the leaves were "fired"

and dried up. Soybeans planted late are not making a normal growth. Those planted earlier are in better condition and are not permanently stunted so far. Vegetables, principally in home and Victory gardens where irrigation is not possible, are severely damaged. Much of the sweet corn crop in south-central Ohio, which ordinarily goes to commercial canneries, will not make sufficient growth to be harvested.

Plant diseases found on leaves as leaf spots and caused by either bacteria or fungi are difficult to find. On corn, Helminthosporium leaf blight has not been observed this season. Likewise, on soybeans no bacterial pustule or frogeye disease leaf spots have been found. -- M. R. Harris, July 24-29.

COLLABORATORS IN SURVEY IN WESTERN MISSOURI: During the week ending July 22, miscellaneous vegetable, fruit, and field crops were inspected in a limited area in the western part of Missouri. The potato-producing area near Orrick (Ray County) was visited with Mr. J. Allison Denning, State Entomologist. In the Courtney area (Jackson and Clay Counties), fields were visited with Mr. J. W. C. Anderson, Extension Horticulturist, University of Missouri, and Mr. Clyde R. Cunningham, Assistant County Agent, Jackson County. Other vegetable and fruit crops in various parts of Jackson County were examined with Mr. Cunningham. -- T. W. Bretz.

COLLABORATORS IN SURVEYS IN IDAHO AND EASTERN OREGON: The surveys in Idaho were made in company with Dr. Glenn KenKnight and the County Agents; in Oregon with Dr. F. P. McWhorter, Robert Rieder, and County Agents. -- Earle C. Blodgett, July 10 - 15.

OTHER REPORTS ON DISEASES OF CEREAL CROPS

Except where noted, reports are of Emergency Plant Disease Prevention Project surveys.

BARLEY DISEASES IN THE NEW JERSEY-DELAWARE-MARYLAND AREA: Bearded barley is usually grown in the Eastern Maryland and Maryland Eastern Shore-Delaware area visited (see above under General remarks), although an occasional field of beardless barley is also seen. Diseases are prevalent and destructive to this crop.

At Gambrills, in eastern Maryland, a trace of Covered Smut (Ustilago hordei) was observed. On the Eastern Shore, in the Centerville-Ridgely area, infection ranged from a trace to 15%, averaging 4 to 5% for the area. Four fields selected at random near Centerville had 2, 4, 10, and 15% of the heads affected. At Ridgely, 2 heavily infected fields showed 10 and 15% infection, while at Goldsboro, 3 fields visited showed 6, 10, and 13%. In the Hazletville, Delaware area, covered smut will not average over 1%. In the Dover area, of 7 fields visited 1 showed no cover smut, 4 contained 1% each, 1 contained 5%, and 1 18%, of the heads infected. At New Castle, one field had 5% infection. Not much barley is grown in New Jersey and in the few fields visited in the southwestern part only a trace of covered smut was observed.

Leaf Rust (Puccinia anomala) was observed as a trace in most fields visited in the Goldsboro area on the Eastern Shore and was practically

absent in other fields examined in Maryland. In Delaware a trace was seen near Hazletville and New Castle, while in the Dover area the disease was very abundant in most fields observed. In New Jersey no leaf rust was seen.

Loose smut (U. nuda) was more abundant in the Goldsboro area on the Eastern Shore than in other sections visited, averaging about 2% for this section. In Delaware, 3 fields in the Hazletville area showed 0.5, 0.5, and 2%; in the Dover area 9 fields had 0.5, 1, 2, 2, 2, 3, 3, 5, and 5%, respectively. One field with 1% was observed at Smyrna, and at New Castle one with 5%. In New Jersey a field near Medford showed a trace, while 4 fields near Vineland contained 0, 0, 3, and 4% infection.

Powdery mildew (Erysiphe graminis) had killed the lower leaves and covered the upper leaves with heavy mycelial mats. Perithecia were abundant on the dead leaves. Powdery mildew is more pronounced in heavy stands where air circulation is poor. Severe and very severe leaf infections were observed in 3 fields near Centerville, 2 at Ridgely, and 3 near Goldsboro, Maryland. In Delaware 2 fields at Hazletville and 5 near Dover and in New Jersey 2 fields near Vineland, were affected severely. Most fields in the 3 States showed light to moderate mildew infection.

Scab (Gibberella saubinetii) [G. zeae] was observed occasionally. It was most noticeable at Goldsboro, Hazletville, and New Castle, where 3% of the heads were affected in 3 fields. Spot blotch (Helminthosporium sativum) was generally present in most fields visited. Stripe (H. graminicum), causing leaf stripe and dwarfed plants, was general in most fields visited, and was especially severe in fields near Ridgely, and Hazletville, and New Castle. -- E. A. Walker, May 15-20.

BARLEY DISEASES IN SOUTHERN MONTANA: Loose Smut, Covered Smut, and Stripe have been seen in all areas visited. Loose Smut on Glacier barley has done the most damage. -- C. M. Slagg, 2 weeks ending July 15.

DISEASES ON CORN IN MISSISSIPPI: Brown Spot (Physoderma zeae-maydis) appears to be the most common and widespread disease at the present time. It was first noted during the week of June 5. Since then, fields have been surveyed in which the disease was not found; other fields contained occasional plants either lightly or heavily infected; and in still other fields 50% or more of the plants were affected in degrees varying from light to heavy. Leaf Blight (Helminthosporium turcicum) appeared to be more or less restricted to the portion of the State south of Meridian. This disease was more common and severe in the southernmost counties (Pearl River, Stone, George, Hancock, Harrison, Jackson). At the Poplarville branch of the Mississippi Agricultural Experiment Station the disease was found to be severe on 2 hybrids from Louisiana and 1 from Florida. Rust (Puccinia sorghi) was noted occasionally. Traces of Diplodia Leaf Spot (D. macrospora) were found in fields between Starkville and Laurel. -- Douglas C. Bain, July 17-26.

DISEASES REPORTED ON SWEET CORN: A trace of Bacterial Wilt (Bacterium stewartii) was observed on corn in southeastern Tippecanoe County, INDIANA. Some small home garden plantings of sweet corn were severely infected. -- J. S. Tidd, week ending July 29.

Numerous sweet corn plantings were examined in southern MICHIGAN. Only a trace of Bacterial Wilt was seen. Insect damage, due to the corn borer, was very severe in many plantings. -- M. R. Harris, July 17-22.

In western MISSOURI, Rust was generally prevalent in one planting examined, and a trace of Smut (Ustilago zeae) [U. maydis] ear infection was also observed. -- T. W. Bretz, week ending July 22.

DISEASES OF OATS: In NEW HAMPSHIRE, a trace of Covered Smut (Ustilago levis) [U. kolleri] and a trace of Leaf Blotch (Helminthosporium avenae) were found in a field in Somersworth. -- Robert C. Cassell, July 17 - 19.

In the Bay area of MARYLAND and DELAWARE, Covered Smut was present to a slight extent in most fields visited, and Loose Smut (U. avenae) occurred in light infections. One field near Dover, Delaware showed 5% Covered Smut; one near Centerville, Maryland, 2% Loose Smut. Light to moderate infection by Leaf Blotch was noted in the Dover area. -- E. A. Walker, May 15-20.

The KANSAS oat crop is perhaps the poorest in years. Only about 70% of the intended acreage was planted and most of that was sown in April, about one month late. Furthermore, a good portion of the acreage sown is in the central and northern part of the State, out of the usual oat growing area. Between June 14 and June 21 the writer saw thousands of acres of oats in an area extending as far west as Hays. Nearly all fields were thin, poor, extremely late, and infected with Stem Rust (Puccinia graminis var. avenae). Kanota and Fulton usually were rather heavily rusted for the stage of growth N e w rust -resistant varieties such as Boone, Tama, Ventura, Osage, and C. I. 4141 were observed in field plots and increase fields at several stations. These varieties usually were nearly rust-free but occasional large, normal uredia of stem rust were found in most of them, indicating late infections of race 8 or 10. At Manhattan rather large spots of heavy Stem Rust infection have developed in resistant oat varieties during the past 10 days. These plots were still standing today, while Kanota and Fulton are already going down from rust infection. -- C. O. Johnston, Division of Cereal Crops and Diseases, July 4.

REPORTS ON RYE DISEASES: One field observed in Dover, NEW HAMPSHIRE, showed 100% severe infection by Leaf Rust (Puccinia rubigo-vera var. secalis). -- R. C. Cassell, July 17-19.

Leaf Rust appeared in light infections in the Cheswold and Leipsic, DELAWARE, section (May 17), and was absent in most fields from Dover to Leipsic. In southwestern NEW JERSEY it was absent in fields near Auburn and Medford, occurred in light infections in fields at Indian Hills and Atkinson, was more prevalent in a field near Fairton, and was rather severe in a field near Center Grove and in one at Vineland. Helminthosporium sativum Leaf Spot was found in a field near Cheswold and in several fields near Vineland. Powdery Mildew infection was light to absent in the Dover area, and was practically absent in fields visited in New Jersey. A Root Rot from which Colletotrichum graminicolum was isolated appeared to be very destructive in small plantings near Vineland; in one field 60% of the plants had been killed. About 2% Stem Smut (Urocystis occulta) infection was observed in one field near Center Grove west of Millville, New Jersey (May 18). -- E. A. Walker

DISEASES OBSERVED ON SORGHUM IN MISSISSIPPI: Several small patches of sorghum were observed throughout the State. Most of them appeared to be completely free from diseases. In one large field in Noxubee County,

traces of leaf Anthracnose (Colletotrichum graminicolum) and Zonate Leaf Spot (Gloeocercospora sorghi) were found. At the Sugar Plant Field Station at Meridian, Ascochyta Leaf Spot (A. sorghina) was general and rather severe, and Anthracnose was found to be severe in spots. What appeared to be Cercospora Leaf Spot (C. sorghi) was also noted. Bacterial Stripe (Phytomonas [Pseudomonas] andropogoni) was severe on some varieties in test plots. -- Douglas C. Bain, July 16-26.

WHEAT DISEASES IN THE NEW JERSEY-DELAWARE-MARYLAND AREA: Many fields were visited during the period May 15-20, when wheat was just heading, in the Maryland-Delaware Bay section and in lower Cumberland County, New Jersey.

Leaf Rust was seldom observed in this area. Near Davidsonville, Maryland, a small field of early wheat ripening at this time showed severe infection on all but the top leaves. Other fields in that section were only lightly affected. Infection was very light in the Kent Island and Ridgely, Maryland sections; in Delaware it was very light at Hazletville, and severe in 2 fields near Dover. Light leaf rust was observed near Buena Vista, New Jersey.

Loose Smut (Ustilago tritici) infected heads are showing up slightly in advance of the heading of smut-free wheat. Near Davidsonville one field showed 8% by count; other fields in this area will average about 1%. On Kent Island, in Centerville, Ridgely, and Denton, Maryland, infection will average 1%; in many fields from 2 to 3% of the heads are smutted. In Delaware, near Hazletville 4 fields averaged 1.2%; near Dover, counts in 3 fields gave 3, 10, 10%. In New Jersey 1% infection was observed in a field near Newport.

Powdery Mildew was not observed in any wheat fields except at Denton, where a light infection was noted.

Scab was seen in a field of advance-headed wheat near Dover, resulting in about 1% loss.

An Undetermined Leaf Spot appeared to be severe in Millville and moderately severe at Newport, New Jersey. -- E. A. Walker.

WHEAT RUSTS IN KANSAS: Winter wheat ripened rapidly during the hot dry period of June 20 to 30, inclusive. Harvest now is in full swing in most of the State except in northwestern and north-central counties. The crop ripened with a minimum of disease and insect damage in the southern half of the State, and yields as well as test weight of wheat are running high. Many reports have been received of test weights well above 60 pounds per bushel, with some samples testing from 64 to 66 pounds per bushel. However, the protein content of much wheat is disappointingly low, probably owing to excessive rain in April and May.

Considerable Stem Rust [Puccinia graminis var. tritici] infection developed on some otherwise very good wheat in the north-central part of the State and test weights in some localities will be low. Such infection developed late in the season and did not result in extremely heavy losses. However, thousands of acres of late wheat in the northern tier of counties, where emergence did not occur until January or later, are certain to be damaged by a combination of stem-rust infection and hot weather.

Heavy Leaf Rust infection developed on some excellent wheat in a strip about 100 miles wide, extending from central Kansas northward at about the

center of the State from east to west. That infection was early enough and heavy enough to cause considerable damage. -- C. O. Johnston, Division of Cereal Crops and Diseases, July 4.

WHEAT DISEASES IN THE NORTHWEST: In southern MONTANA, Stem Rust was first seen on wheat near Hardin on July 15. Dwarf Bunt (Tilletia tritici [T. caries] special race) was first seen July 1 in the Spring Hill area of Gallatin County. Ordinary Rough-Spored Bunt [T. caries] has been seen in a number of localities, the worst infection causing 25% loss in a field near Custer. Loose Smut has been noted in several fields in the Hardin area. Leaf Rust was present in all wheat fields examined, but caused only slight damage. -- C. M. Slagg, period ending July 15.

Traces of Leaf Rust were found in eastern Whitman County in eastern WASHINGTON and in western Latah County in IDAHO. Powdery Mildew, while general on heavy growth, was not severe. -- Earle C. Blodgett, July 2 - 8.

In central WASHINGTON, wheat in the central and eastern part of Klickitat County (July 8) will make an excellent yield. It appeared free from disease, although the grain from parts of certain fields was mottled in color. Rex and a Club type of wheat were most evident here. Wheat in the vicinity of Waterville in Douglas County (July 17) also showed prospects of a good crop. Only traces of Bunt [? T. caries] were found in certain fields; on the whole, this disease has been well controlled. Considerable red color was evident in the leaves of certain fields. The Extension Agent reported that Snow Mold [cause not specified] had caused serious loss in some fields of this area the past season, making it necessary to reseed parts of fields to spring varieties. In addition to the loss of the crop suffered, such mixed winter and spring plantings present problems of harvest and separation, if uniformity is desired in the grain. -- Lytton W. Boyle.

REPORTS ON DISEASES OF FORAGE AND COVER CROP LEGUMES

Reports are of Emergency Plant Disease Prevention Project surveys.

DISEASES REPORTED ON ALFALFA: Leaf Spot (Pseudopeziza medicaginis) was moderately severe near Annapolis and Centerville in MARYLAND and in the Hazletville-Dover areas in DELAWARE, where the middle leaves were affected. Slight to moderate infection on only the lower leaves was noted in Cumberland County, NEW JERSEY. Stagonospora meliloti Leaf Spot was abundant in one field near Sandy Point, Maryland. Drought was damaging the crop in the Millville-Vineland area in New Jersey. -- E. A. Walker, May 15-20.

In about half of the alfalfa fields visited in Tippecanoe County, INDIANA, Pseudopeziza Leaf Spot was common, causing yellowing of the leaves. As many as 20% of the plants were estimated as being severely defoliated in one 5-acre field. -- J. S. Tidd, week ending July 29.

Downy Mildew (Peronospora trifoliorum) caused 75 to 90% loss in the first cutting on 4 fields in the Hamilton-Stevensville area in southern MONTANA. --C. M. Slagg, fortnight ending July 15.

In central WASHINGTON, traces of Downy Mildew and of Witches' Broom (Virus) were noted in Yakima County (July 10-12). Gray blotches, on which no conidiophores or fruiting bodies were evident on field examination, appeared on the leaves of some plants. It is suspected that these may be incipient infections of Downy Mildew. Pseudopeziza Leaf Spots were not evident

on the second growth but leaves on old stems missed in the first cutting were well covered. Patches in some fields in Yakima County showed yellowed leaves and poor development. No evidence of infection was found on the stems or roots of affected plants and it appears that factors of soil fertility and moisture were the cause of the trouble. In some cases the grower claims the first crop from such areas in the field appeared normal.

Witches' Broom was causing such severe losses near Twisp in Okanogan County (July 19-20), that production of the crop seemed a somewhat futile effort. Symptoms were readily noted in any field observed. The disease was prevalent along the Methow and Okanogan Rivers. -- Lytton W. Boyle.

REPORTS ON CLOVER DISEASES: Crown rot (Sclerotinia trifoliorum) was not observed on crimson clover in the Annapolis, Ridgely, and Denton areas in MARYLAND, and the Cedarville, Millville, Newport section of NEW JERSEY, nor on red clover in fields near Cheswold, DELAWARE. Two crimson clover fields near Henderson, Maryland, near the Delaware line, showed a few plants killed by the disease. -- E. A. Walker, May 15-20.

Powdery Mildew (Erysiphe polygoni) was present on the lower leaves in a number of fields in Tippecanoe County, INDIANA, but no appreciable damage appeared evident. -- J. S. Tidd, week ending July 29.

Sooty Blotch (Dothidella [Cymadothea] trifolii) was seen in the Bitterroot Valley in MONTANA. -- C. M. Slagg, fortnight ending July 15.

In Nez Perce County in western IDAHO a severe Leaf and Stem Blight was observed on red clover. The cause was not determined although it appeared to be bacterial. Powdery Mildew was severe on red clover. In one field one sulfur dusting gave excellent results. -- Earle C. Blodgett, July 10 - 15.

DISEASES ON COWPEA AND VELVET BEAN IN MISSISSIPPI: Leaf Spot (Cercospora vignae) was not uncommon in cowpea fields. At the U. S. Sugar Plant Field Station at Meridian a large, well-defined Leaf Spot (probably Amerosporium oeconomicum) was fairly common in one field.

Velvet beans are commonly grown with corn on many small farms in southern Mississippi. Two distinct Cercospora Leaf Spots were found to be rather common in fields in the Wiggins-Lucedale area and towards Gulfport. The species are possibly C. stizolobii and C. mucunae. Specimens have been sent to Dr. Charles Chupp for determination. -- Douglas C. Bain, July 17 - 26.

REPORTS ON SOYBEAN DISEASES: Near Denton, MARYLAND, Bacterial Blight (Pseudomonas glycinea) was severe on the leaves of nearly all plants in a volunteer field, and Downy Mildew (Peronospora manshurica) was very severe in another field of volunteer plants. -- E. A. Walker, May 17.

Bacterial Pustule (Bacterium [Xanthomonas] phaseoli var. sojense) was found in variable amounts in all of the fields observed in MISSISSIPPI. In general, infection appears to be light, although slight damage due to heavy infection was apparent in occasional fields. Downy Mildew was found in fields south of Meridian.

A striking condition was seen in one field near Yazoo City and another at Stoneville. Plants in large areas were in a wilting condition and rather yellowish. Large dead patches occurred on many of the leaves. No signs of infection could be found on roots or above-ground parts. It appeared

as though the plants were suffering from lack of water although the condition was not restricted to high ground. It is possible, as Dr. J. A. Pinckard suggested, that large sand traps beneath the surface soil might account for lack of sufficient moisture in affected areas. -- Douglas C. Bain, July 17-26.

Soybeans appeared to be in a healthy condition in Tippecanoe County, INDIANA. However a 10-acre field, observed by Dr. Paul R. Miller and the writer in Warren County July 22, was severely damaged in very irregular areas covering about 1/10 of the acreage. Death and dying of plants appeared to follow the wilting of earlier stages. The trouble may have been physiological, although lesions found on the stems may indicate otherwise when the results of cultures are obtained. -- J. S. Tidd, Week ending July 29.

A number of plantings were observed in Jackson County in western MISSOURI. Bud Blight (Virus) infection was noted in 2 of the fields, affecting a few scattered plants. Light Bacterial Blight infection of the lowermost leaves was general in one field. -- T. W. Bretz, week ending July 22.

Mosaic (Virus) and an unidentified Virus-like disease were noted on soybeans in Malheur County, in eastern OREGON. -- Earle C. Blodgett, July 10-15.

DISEASES REPORTED ON SPECIAL CROPS

Reports are of Emergency Plant Disease Prevention Project surveys.

DISEASES OF COTTON IN MISSISSIPPI: Fusarium Wilt (Fusarium [oxysporum f.] vasinfectum) and Angular Leaf Spot (Xanthomonas malvacearum) were the most common and widely distributed diseases of cotton observed throughout the State. Both diseases generally were found only in trace amounts. Occasionally, however, Angular Leaf Spot was found to be rather severe especially at Stoneville and around Tupelo. Leaf Spot (Cercospora gossypina) was seen in small amounts in scattered fields. Nothing that could be diagnosed definitely as Verticillium Wilt was found. -- Douglas C. Bain, July 17 - 26.

CURLY TOP ON SUGAR BEETS: E. W. Bodine reports (July 9-22) that sugar beets examined in Montrose, Delta, and Mesa Counties in western COLORADO appeared to be in excellent condition. A trace of Curly Top (Virus) was found in Montrose County. Curly Top was rather prevalent in 2 fields examined in Malheur County in eastern OREGON, according to Earle C. Blodgett (July 10-15).

TOBACCO SEEDBED DISEASES IN MARYLAND: Anthracnose (Colletotrichum sp.) was present to a slight extent on leaves in most plant beds in the Gambrills area in Anne Arundel County, causing considerable loss in several. Blue Mold (Peronospora tabacina) began to appear in the Gambrills-Davidsonville area May 15. Sprayed beds appeared to be unaffected at this time. -- E. A. Walker, May 15 - 20.

TOBACCO FIELD DISEASES IN GEORGIA: A survey was made of the Flue-cured tobacco belt during the period July 19-24. Dr. E. E. Clayton, Mr. J. G. Gaines, and Mr. A. L. Taylor accompanied the writer on the 24th. About 3/4 of the crop had been harvested. The fact that a part of the crop had

been harvested made disease observations easier, and too, at this stage maximum disease damages are to be found.

Nematode: Nematode Rootknot [Heterodera marioni] is the most important disease on tobacco in the Flue-Cured belt of Georgia. Hardly a field can be found where Rootknot is not present. It is hard to estimate the overall damage caused but it is probably near 5%. In fields examined in this survey this estimate would be conservative. A few fields were found where the damage was near 25%. The Meadow Nematode [Pratylenchus pratensis] is often found and apparently causes considerable damage at times. However, it is not nearly so common as the Rootknot nematode.

Sclerotium rolfsii: Southern Blight is probably the second most important disease in the Georgia Flue-Cured belt. On an average for the fields examined about 2% of the plants had been killed by the disease. One field ran as high as 14%. Usually the disease is scattered rather uniformly over the field; occasionally, "intensified" spots are found.

Sclerotium bataticola: An occasional plant was found that had been killed by this fungus. In one field the number of dead plants from this organism was about 3%.

Mosaic (Virus): Scattered Mosaic (common) plants were found in each of 2 fields, one near Moultry, the other near Omega.

Leaf Spots: Cercospora nicotianae Leaf Spot (Frogeye) was found to be rather prevalent, possibly more so than usual. Brown Spot (Alternaria) was usually present but considerably less prevalent than Cercospora.

Bacterial Wilt: Bacterial Wilt (Bacterium [Pseudomonas] solanacearum) was found in a small area in one field.

Root disorder complex: Several fields were examined where severe damage has resulted from a combination of Rootknot and Sclerotium rolfsii. In the fields where severe Rootknot was found, the plants were severely stunted but had not been killed. Also, in the fields where Southern Blight was severe dead plants were scattered among apparently healthy plants; where, however, the percentage of dead plants was high the trouble was more or less limited to the roots. In other words, typical Southern Blight symptoms were not expressed in the majority of the plants. -- G. M. Stone

OCCURRENCE OF POTATO LATE BLIGHT AND OTHER DOWNY MILDEWS IN MASSACHUSETTS

O. C. Boyd

Potato Late Blight: Late blight [Phytophthora infestans] was first observed this year in Plymouth County on July 25 while in company with R. E. Cassell of the Emergency Plant Disease Prevention Project, -- a light infection in a single field of Green Mountain potatoes that had been rather poorly dusted with a copper-lime-arsenate dust. On July 28, 9 potato fields in the Connecticut River Valley of Hampshire and Franklin Counties were examined, and late blight observed in 4 of them. In all cases, the disease appeared to be of recent development. However, in one field of Green Mountains that had been sprayed not more than 2 or 3 times at the most, a general and moderately heavy infection was present including practically 100% of the plants. No blight was observed in any of the well-sprayed fields of the same sections.

Spinach Downy Mildew: While in Bristol County on July 12 and 13, a few cases of this downy mildew disease [Peronospora effusa] were observed in Rehoboth and Seekonk. It was most pronounced in irrigated fields.

Onion Downy Mildew: This disease [Peronsopora destructor] has not been observed this year in the extensive seed- and set-onion area of the Connecticut Valley, but one infected crop of seed onions was observed in Seekonk, Bristol County, on July 13. Nearby were growing wintered-over seed onions for seed production. In the same neighborhood were a few plantings of top-set onions, but these did not show downy mildew.

Cucurbit Downy Mildew Not Seen: Although a thorough search was made during July 12 - 13 in Bristol County and on July 25 - 26 in Plymouth County for cucurbit downy mildew [Pseudoperonospora cubensis] none was seen. The weather has been unusually dry in both of these counties this summer, most vegetable crops suffering noticeably at present from the drought. MASSACHUSETTS STATE COLLEGE.

REPORTS ON DISEASES OF POTATO

Except as indicated, reports are of Emergency Plant Disease Prevention Project surveys.

POTATO DISEASES IN MAINE: From July 20 to 23 a survey was made in York and Cumberland Counties. Counts were made in 2 fields in Wells where Leaf Roll (Virus) seemed to be running a little high. One field of Green Mountain showed about 15%, and one field of Cobbler, about 20% Leaf Roll. Purple Top (Aster-Yellows Virus) was found in one field in Wells; less than 1% was present. Bacterial Ringrot (Corynebacterium sepedonicum) was found in a 10-acre Cobbler field in Cape Elizabeth. As nearly as could be determined at this early date about 15 to 20% of the plants were affected. Identification was based on plant appearance and verified by Dr. O. C. Boyd. -- Robert C. Cassell.

POTATO DISEASES IN NEW HAMPSHIRE: Less than 1% Blackleg (Erwinia atroseptica) [E. phytophthora] was found in one field in Durham and in one field in Dover. A rather serious case of Rhizoctonia [R. solani] was found in one field with well-developed tubers, in Dover. About 20% of the plants examined showed rot and lesions on the roots and stolons. Abscission of the tubers may result. Potato fields were too far advanced for accurate Leaf Roll counts but a few were attempted. Most fields seemed to average about 5 to 7%, although one Chippewa field counted about 12%. Tipburn (cause questionable) is not serious to date although it has a good start. -- Robert C. Cassell, July 17-19.

LATE BLIGHT AND OTHER DISEASES IN MASSACHUSETTS: Late Blight was found for the first time this year in Massachusetts on July 25 in company with Dr. Boyd and Mr. Beattie in Brockton, Plymouth County (see also Boyd's report above). About 1/4 of a field of Green Mountain had a light infection spreading from one heavy primary infection center near the middle of the field. There appeared to be no Late Blight in adjoining fields and subsequent surveys in Plymouth, Middlesex, and Worcester Counties failed to reveal any other Late Blight.

Early Blight (Alternaria solani) is now present in practically all fields in the State. Prevalence ranges from 20 to 100% and severity is mostly light to moderate. Scab (Actinomyces scabies) was found in a 7-acre Green Mountain field about 3/4 mature in North Middleboro. Prevalence varied through the field, but in some spots the surfaces of the tubers were completely covered with lesions, representing the worst case of Scab that the writer has ever seen. Blackleg was found in one field in Grafton and one in Concord; less than 1% occurred in either field. A trace of Purple Top was seen in one field in Concord. -- Robert C. Cassell, July 24 - 29.

POTATO DISEASES IN WESTERN NEW YORK: In the 11 potato fields visited, the most serious problem encountered was Leaf Roll, which ran as high as 80% in one field. Late Blight is undoubtedly present in each of the counties visited, but none was recognized in the fields seen. An interesting case of Copper Injury to the leaves was observed in Monroe County. The operator of the sprayer, for reasons of convenience, had filled his sprayer tank with concentrated copper sulfate, and had then proceeded to add the necessary water and then lime. The first few feet sprayed with each tankful was sprayed with the copper sulfate solution, which had gravitated to the spray pipes. "Z" disease (Fusarium eumartii) [F. solani f. eumartii] was found on Houma potatoes in Niagara County. -- John S. Niederhauser, July 24 - 28.

POTATO DISEASES IN THE TEXAS PANHANDLE: During the period July 18 - 24, a survey of the potato growing areas of the Texas Panhandle was made. At Lubbock, Muleshoe, Hereford, and Plainview the harvest was just beginning. Harvest at Texline will not begin until the latter part of September or early October. There will be some late maturing potatoes in the other areas, but these will not be in very great quantity.

The most destructive disease in all areas except that at Texline was Psyllid Yellows. Infestation appeared to be most severe, and the damage greatest in the vicinity of Lubbock, although there were some fields of potatoes which suffered rather severe damage at Hereford and between Plainview and Floydada. No psyllids nor Psyllid damage was seen at Texline. Most farmers had attempted some control, but usually discovered the infestation too late. Several reported reduction of yield as great as 40 and 50%.

Early Blight was found in all areas, and was most intense at Muleshoe. Infection in other areas varied from trace in the Texline area, to slight at Hereford and Lubbock. Infection was limited to leaf areas principally, and no tuber infections were noted in potatoes being washed and graded.

No Late Blight infection was found, although temperatures were probably low enough on the 20th and 21st of July.

Common Scab was severe in some fields, and was more common in the Lubbock area than at Plainview and Hereford. No potatoes were being graded at Muleshoe at the time of my visit. Growers recognize this disease readily, but few take precautions against it at planting time. Average loss due to Scab in the Lubbock area would approximate 5%.

It was too late in the season to determine damage to plants by Rhizoctonia in all areas except Texline, where plant mortality is about 0.5% at present. Cankered plants were directly traceable to infected seed-pieces.

Harvested potatoes moving through washer and grader were found to have traces of Black Scurf occasionally. On one lot at Lubbock, the Inspector warned that graders should be more particular, as the percentage of potatoes with scurf was getting near maximum permitted.

Fusarium Wilt was found affecting approximately 1% of the plants of Katahdin potatoes at Texline, and traces of wilt were found in other fields in this area. Traces of wilt were observed in fields at Muleshoe, and at Hereford, one field showed about 10% infection.

A trace of Blackleg was found in a field of Pontiac variety of potato near Texline.

Some damage due to Sunburn was seen but most growers take the precaution of harvesting only in the cooler parts of the day, or in cloudy weather.

Some bacterial soft rot, Fusarium dry rot, and other types of decay were observed occasionally. There was no charcoal rot seen. Much of the tuber damage was mechanical.

In the area affected by Psyllid Yellows, the determination of Virus Diseases was difficult. Traces of Leaf Roll, Spindle Tuber, Spindling Sprout, and Mild Mosaic were seen. In one field of plants from home-grown seed, about 30% of the plants showed Mild Mosaic. -- George E. Altstatt.

POTATO SCAB IN AN INDIANA HOME GARDEN: In a 1/4-acre planting of Early Bliss in a home garden plot in Tippecanoe County the tubers were almost 100% infected with Actinomyces scabies, causing a severe scabbing. -- J. S. Tidd, week ending July 29.

POTATO DISEASES IN SOUTHEASTERN MICHIGAN: Several fields consisting of a total of more than 50 acres were inspected in southeastern Michigan. A trace of Bacterial Ringrot could be found in one field. The plants were relatively immature. Leaf Roll was present in most fields but was difficult to detect because of drought conditions which caused extensive leaf curling. No trace of either Early or Late Blight was found. It is probable that the crop has already been slightly damaged by Drought. -- M. R. Harris, July 17 - 22.

POTATO DISEASES IN WESTERN MISSOURI: The potato-producing area near Orrick (Ray County) was visited with Mr. J. Allison Denning, State Entomologist. In the Courtney area (Jackson and Clay counties), fields were visited with Mr. J. W. C. Anderson, Extension Horticulturalist, University of Missouri and Mr. Clyde R. Cunningham, Assistant County Agent, Jackson County.

In both of the potato producing areas visited, digging of the crop was progressing rapidly. Production is considerably below that of former years, due to the smaller acreage planted, the loss of some fields or portions of fields to flood waters, and the adverse weather conditions during the growing season. In general the tubers were still immature and "skinning" badly. Although the vines were still partly green, the condition of the foliage was such that diseases affecting the aerial parts of the plants were difficult to detect. Severe Tipburn and Hopperburn had caused much damage to the leaves. A trace of Early Blight foliage infection was noted. In one field in the Orrick area moderately heavy Rhizoctonia infection of the stems was noted. Evidence of Wilt (probably Fusarium sp.) was noted in a few plants and cut tubers in a number of fields. All the fields

showed from a few to many of the tubers with a roughened, "scabby" surface, a condition called "Sand Rust" by the growers. This trouble appeared to be more serious in the lighter, sandy types of soil than in the heavier soils. The lesions were superficial in that only the skin layer was involved and microscopic examination of the affected tissues failed to reveal the presence of any micro-organism. In some fields the tubers had developed very much Enlarged Lenticels, probably due to the excessively moist soil. The tubers generally appeared to be in a sound condition and no Tuber Rot was observed. A trace of Rhizoctonia infection of the tubers was noted. -- T. W. Bretz, week ending July 22.

POTATO DISEASES IN WESTERN COLORADO: The following diseases were commonly found in the Fruita district in Mesa County: Scab, Bacterial Ringrot, Fusarium Wilts due to F. solani and F. oxysporum, Rhizoctonia solani, the Virus diseases Leaf Roll, Mosaic, and Spindle Tuber, and the psyllid-induced Psyllid Yellows. -- E. W. Bodine, period ending July 22.

CHARCOAL ROT IN CALIFORNIA POTATOES: During the first 2 weeks of July a few shipments of White Rose potatoes from Kern County, California, arrived on the Chicago market showing extensive decay caused by Sclerotium batatícola Taub. One car showed a range of 5 to 25% of charcoal rot with an average of 11% for the load. This is the first time that charcoal rot on white potatoes has been found to be of commercial importance on this market. All infections appeared to have originated at the stem end of the tubers. Black areas about the stem and cloudy blotches around the eyes were characteristic external symptoms of the decay. The fungus progressed throughout the tubers causing a semi-watery, flabby breakdown of all tissues. On cutting the tubers the affected areas appeared yellowish to light buff but soon changed to pinkish buff, then brown, and finally black. Only a few sclerotia were found under the skin of tubers showing advanced decay. Pure cultures of S. batatícola isolated from decaying tubers proved to be strongly pathogenic to White Rose and Bliss Triumph potato tubers when they were inoculated through wounds and held at 85° to 90° F. -- G.B. Ramsey, U. S. Department of Agriculture, Bureau of Plant Industry, Soils, and Agricultural Engineering, Chicago, Illinois.

VIRUS DISEASES IN SEED-POTATO TEST PLOTS IN CALIFORNIA: On July 19 a trip was made in company with Dr. M. W. Gardner, Dr. J. B. Kendrick and Dr. W. C. Synder of the University of California to the seed potato test plots located near Half Moon Bay in San Mateo County. This plot was set up by the State Department of Agriculture to grow samples from seed lots of potatoes used to plant fields for which seed certification is desired this year. The data gathered from this test plot on the presence and amounts of the tuber-borne viruses will be used to supplement the data taken in the fields planted with the same seed lots, when these fields are inspected for certification. The use of such a test plot alone, however, would give no indication of the amount of the current spread of the viruses in the field. Such spread is known to vary greatly in different localities. This year applications have been made for inspection and certification of approximately 5000 acres of seed potatoes in California.

The varieties included in the test plot were White Rose, Notted Gem, and Burbank. Approximately 110 seed lots (some from States other than California) were sampled and planted in this plot. Each sample consisted of

115 tubers for White Rose, or of 65 tubers for the other varieties. Each tuber was cut into 3 or 4 pieces and planted as a tuber unit on May 25 to 27. The site of the plot near the coast was chosen because of the cool climate which favors the expression of the virus symptoms.

The potato growers, the officials of the State Department of Agriculture, and the University of California Pathologists who saw the plot agreed that the use of this test plot has been a successful method of checking the seed lots for tuber-borne viruses. The continued use of a similar test plot each year is apparently being planned.

The most prevalent virus disease evident in the test plot was Rugose Mosaic. It was present in nearly all of the seed lots, but considerable variation was noted in the prevalence in the different seed lots. Mild Mosaic was also common in the plot. Plants exhibiting symptoms intermediate between Rugose Mosaic and Mild Mosaic were also commonly seen. Leaf Roll was present in a number of seed lots but the percentage of infection was very slight. A few plants tentatively diagnosed as Haywire disease were scattered through the plot. The only disease of fungous or bacterial origin observed in the plot was Rhizoctonia. This was represented by a few scattered infected plants. -- H. L. Barnett.

REPORTS ON DISEASES OF TOMATO, EGGPLANT, AND PEPPER

TOMATO DISEASES IN NEW HAMPSHIRE: In the experimental plots at Durham Early Blight (Alternaria solani) was 100% prevalent on an early variety, accompanied by defoliation and moderate spotting of the fruits. Early Blight was also found in Dover and Stratham. In Dover prevalence was 100% on the early plantings and severity light, but there was no blight on the fruits. In Stratham only a trace was found on the leaves. A trace of Mosaic (Tobacco Virus) was found in one planting in Greenland, and a trace of Streak (Virus) in one in Stratham. -- Robert C. Cassell, July 17-19.

TOMATO DISEASES IN MASSACHUSETTS: A survey was made July 24-29 in Plymouth, Middlesex, and Worcester Counties, in southeastern, north-eastern and central Massachusetts, respectively. Early Blight can be found in practically all plantings, excepting possibly some of the latest. In most fields prevalence ranges from 5 to 100%, with an average of about 50 to 60%. Severity is mostly light, with a few fields having moderate infection. Blossom-End Rot (Physiogenic) was found in one field in West Bridgewater; less than 1% was present. Fusarium Wilt (F. oxysporum f. lycopersici) was about 5% prevalent in a half-acre planting in West Bridgewater. A light infection by Leaf Mold (Cladosporium fulvum) was observed on about 20% of the plants in a 1-acre field in North Grafton. -- Robert C. Cassell

TOMATO DISEASES IN WESTERN NEW YORK: The 24 tomato fields visited, mostly in Orleans County, looked exceptionally good, with very little disease present. Most of these fields were planted with sprayed plants grown from treated seed. The principal varieties seen were Stokesdale, John Baer, and Rutgers. The John Baer variety in many cases was beginning to ripen, while Stokesdale and Rutgers are well set.

One of the most important factors affecting production was the method and timing of cultivation. In nearly half of the fields visited there was

evidence that cultivation had been done too deeply or too close to the plants, causing a yellowing and curling of the lower leaves. In a number of cases heavily fertilized soils had been thrown up near to the plants, and during the dry weather that followed the deleterious effect of the deep, close cultivation was accentuated.

In the two fields which showed the most Blossom-End Rot, it was suspected that faulty cultural practices had contributed in large measure to this trouble.

Tobacco Mosaic (Virus) and Aster Yellows (Virus) occurred in traces in 7 fields. "Cat-face" was serious in the earlier-planted part of one field of 25 acres, where 25 to 30% of the fruit was affected. Blossom-End Rot was present in most fields in traces, but as yet was serious in only 2 of those visited. Early Blight was seen in 2 early-planted fields, but was not yet serious in either. Bacterial Canker (Corynebacterium michiganense) was present as a trace in one field. Septoria leaf spot (Septoria lycopersici) was generally present in 2 fields; in each case the field had been in tomatoes the year before and the seed had not been treated. -- John S. Niederhauser, July 24-25. (See also above under General Remarks).

TOMATO DISEASES IN INDIANA: In company with Dr. R. W. Samson and R. R. Fraser of the Purdue Experiment Station, the first part of the week ending July 29, was spent in an examination of tomato canning acreage in east-central Indiana, at least 25 fields from 2 acres to 50 acres or more in size being visited in Clinton, Tipton, Madison, Blackford, Jay, and Randolph Counties. Part of one day was also spent with Dr. Samson examining tomato fields in Tippecanoe County.

Fusarium Wilt was encountered in at least half of the fields in east-central Indiana. In most of this acreage only a few plants to as many as 2% were infected. In one field, however, of 15 acres in Clinton County, approximately 33% of the plants at one end had Fusarium Wilt, the probable reason being that refuse from a cannery had been dumped here the previous season. Seventy percent of the plants in one half of a 22-acre planting in Tipton County were severely wilted due to Fusarium. The plants in this field had been set at 3 different times and those in the infected area may have been from another source or planted in ground in which tomatoes had previously grown, although the grower claimed this not to be the case. In all the above fields showing Fusarium Wilt, the plants had come from the South, principally Georgia and Tennessee. However, a 15-acre field in Blackford County set with plants from the Vincennes, Indiana area, showed 33% of the plants with Wilt. In the 25 fields surveyed, only 2 of the fields showing Fusarium Wilt were planted to the Rutgers variety and these had only a trace. The other fields with Fusarium Wilt were planted with the Indiana Baltimore variety.

A trace of Collar Rot caused by Alternaria solani was present in many of the fields. Only 2 fields, however, showed severe injury. One was a 5-acre planting of Georgia-grown plants of the Baltimore variety in Tipton County in which 50% of the plants were either dead or dying; the second, a 2-acre field of home-grown Rutgers in Jay County, in which approximately 20% of the plants were in poor condition.

Small areas, consisting of but a few plants were found in 2 fields, showing symptoms of Early Blight on the leaves. The same was true for Septoria Blight.

In various fields, an occasional tomato was observed with Blossom-End Rot. Several plants in one field were observed covered with Dodder [Cuscuta sp.] which had apparently come in with the plants. Walnut Wilt (non-parasitic) was observed at the edges of several tomato fields, where the plants had been set too near walnut trees bordering the plantings. -- J.S. Tidd.

TOMATO DISEASES IN SOUTHERN MICHIGAN: A number of tomato fields south and west of Detroit were examined. A trace of Early Blight could be found on the oldest leaves of susceptible varieties. Likewise, on old leaves Septoria Blight was present. However, no new or fairly mature leaves several weeks old were infected, owing to dry weather. Growers as a group are not doing much spraying and only a few are trying to carry out a regular spraying program. In most fields there were a few vines showing Fusarium Wilt. In one field plants in an area of about half an acre were showing severe damage due to Wilt. -- M. R. Harris, July 17 - 22.

GREENHOUSE AND FIELD DISEASES OF TOMATOES IN WESTERN MISSOURI: (Greenhouse). The production of tomatoes under glass is near an end for this season in the Kansas City area. Leaf Mold and Fusarium Wilt appear to have been the major disease problems in the ranges visited. Leaf Mold infection was observed in every range, ranging from a trace to a situation in one house in which two-thirds of the foliage was already dead and the remainder was heavily infected. Wilt was responsible for much damage in many instances, from 5% to 33% kill being noted. Most of the plants had attained a relatively good growth before death and in all probability had matured one to several clusters of fruit. Mosaic (virus) infection was evident in all houses but the extent of its severity was difficult to determine because of the generally poor condition of the foliage. The fruit appeared to be relatively free from disease. A trace of Buckeye Rot (Phytophthora sp.) was noted. An estimated 1 to 2% of the fruits showed Blossom-End Rot and 2 to 3% had developed secondary decay following fruit worm damage.

(Field). Staked, field tomatoes were coming into full production in this area. Mosaic appeared to be the most prevalent and serious disease present. Some fields showed only a few scattered plants infected; in other fields from 50% to more than 90% of the plants were involved. In the severely diseased fields, a few scattered plants were found which were very badly dwarfed and had set no fruit. The initial infection in these plantings appears to have originated in the greenhouses where the plants were started and where Mosaic was already prevalent in ranges devoted to tomato culture. Light to moderately heavy Early Blight infection of the foliage was observed, and it was responsible in at least one instance for the death of much foliage. A trace of Septoria Leaf Spot was also observed. From a trace to 3% of the plants in the various fields showed Fusarium Wilt infection. One field which has been planted to tomatoes for at least three successive seasons showed heavy Bacterial Spot (Phytomonas [Xanthomonas] vesicatoria) infection of the fruits (approximately 20%) and moderately heavy foliage infection. An estimated 5% of the fruits showed Blossom-End Rot. A trace of Bacterial Canker, Anthracnose (Colletotrichum phomoides), and Buckeye Rot on the fruits, was noted. -- T. W. Bretz, week ending July 22.

VIRUS DISEASES AND BACTERIAL CANKER ON TOMATOES IN WESTERN COLORADO: Spotted Wilt (Virus) was found in all fields inspected in Mesa County. In some fields from 10 to 20% of the plants were infected. The disease will cause considerable damage in some fields in this County. A trace of Curly Top (Virus) was found in all fields visited. Aucuba Mosaic (Virus) was also found in all fields; from 5 to 10% of the plants were infected in many fields. A trace of Bacterial Canker was found in a few fields. -- E. W. Bodine, weeks ending July 15 and 22.

DAMAGE FROM THE TOMATO RUSSET MITE IN ARIZONA: The first report of the tomato russet mite, Phyllocoptes destructor, in Arizona was during the fore part of December, 1943. Mr. R. A. Flock, state nursery inspector, observed it infesting one planting of tomatoes at Mesa, Arizona. Mesa is located in the Salt River Valley. Shortly afterward, it was found infesting tomatoes in the Department of Plant Pathology greenhouse, University of Arizona, Tucson.

From June 6 - 9, 1944, practically all the commercial tomato plantings were observed in the Salt River Valley for the purpose of determining the damage resulting from the virus causing curly top. During this survey, no injury was observed typical of that caused by Phyllocoptes destructor. On July 12, a 2-acre planting previously observed on June 8 was found to be severely infested with the tomato russet mite. The following day a 20-acre planting was found where moderate damage had been done. The grower had dusted with sulphur and the new growth was free from infestation. According to Mr. H. B. Powers, Assistant County Agent in Maricopa County, the tomato russet mite had been found infesting tomatoes in a few victory gardens in the Salt River Valley. The mite was also reported on tomatoes in a number of Tucson victory gardens. Just recently (July 28, 1944) it was observed on tomatoes again in the Department of Plant Pathology greenhouse at the University of Arizona. -- William G. Hoyman

CURLY TOP ON TOMATOES IN THE NORTHWEST: In central WASHINGTON, Curly Top has caused severe losses in both commercial and home plantings from Klickitat County north to the Canadian border. It has been noted to be especially severe on tomatoes. Certain large plantings in the Yakima Valley will be a total loss. Home gardeners are especially concerned about the loss of their tomatoes. Attention of the county agents has been called to the use of shade to reduce the loss due to this disease. Since there are very few commercial plantings in the northern part of this area, it seems there is still a chance to gain some worthwhile production for local consumption by this means. -- Lytton W. Boyle, July 7-21.

Curly Top was found to be rather prevalent on tomatoes in Malheur County in eastern OREGON. -- Earle C. Blodgett, July 10 - 15.

VERTICILLIUM WILT OF EGGPLANT IN MICHIGAN: A 5-acre field of eggplant south of Detriot was being damaged by Verticillium Wilt (V. albo-atrum). Plants were in all stages of wilting from those completely killed to those merely wilting slightly during the middle of the afternoon. So far, about 1% of the plants are affected. -- M. R. Harris, July 17-22.

DISEASES REPORTED ON PEPPERS: Bacterial Leaf Spot (Xanthomonas vesicatoria) was observed on seedlings near Buena Vista, and noted to be severe in part of a seedbed in Vineland, NEW JERSEY. -- E. A. Walker, May 15 - 20.

In Jackson County, in western MISSOURI, a planting was observed in which a blighting of the main stem and lateral branches was prevalent, the cause tentatively being diagnosed as Phytophthora Blight (P. capsici). Approximately 10% of the plants had been killed and 50% of the remaining stand showed one or more cankers per plant. Bacterial Spot was prevalent on the foliage, causing much spotting and some defoliation. -- T. W. Bretz, week ending July 22.

REPORTS ON DISEASES OF PEAS

Except where noted otherwise, reports are of Emergency Plant Disease Prevention Project surveys.

NONPARASITIC SEED SPOTTING IN SOUTHWESTERN MAINE: Seed Spotting was found to be causing a slight to moderate amount of damage to Telephone peas in Wells in York County. -- Robert C. Cassell, July 20-23.

BACTERIAL BLIGHT ON PEAS IN NEW YORK: On June 27, Bacterial Blight of pea (Pseudomonas pisi Sackett) was found in one lot of Thomas Laxton peas located among numerous varieties in test plots at Mt. Morris (Livingston County). On July 7, a field of Thomas Laxton peas near Skaneateles (Onondaga County) showed at least 80% foliage and stem infection and about 25% pod spotting. The field was being harvested at the time so that no measurable damage occurred. A planting of Alderman variety immediately adjacent to the Thomas Laxton planting showed only a trace of the disease along the edge bordering on the Thomas Laxton. The seed sources were not determined, but it is known that they were not home-grown seed.

According to Dr. Charles Chupp of Cornell University, Bacterial Blight has not been observed in commercial pea fields in New York State for the past 6 or 7 years. -- W. T. Schroeder, New York State Agricultural Experiment Station, Geneva.

ROOT ROTS AND OTHER DISEASES IN SOUTHERN MONTANA: The southwestern, south-central, and southeastern parts of Montana were covered during the fortnight ending July 15. Special attention was given to canning and field peas.

By far the most important and destructive group of pea diseases encountered were the Root Rots and Wilts. Many fields were seen in which the crop was an almost complete failure due to Root Rot. The Wilt encountered is believed to be Near-Wilt (Fusarium oxysporum f. pisi race 2), as it tended to kill the scattered plants in otherwise thrifty fields. Most of the Root Rot is believed to be the Common Root Rot (Aphanomyces cuteiches), as the surface of the roots affected tended to slough off. Some time was spent in microscopic examinations of diseased roots, and root-rotting fungi were found present in the following order of frequency: A. cuteiches universally and copiously present, Pythium ultimum plentiful, Corticium vagum [Pellicularia filamentosa] common, Fusarium solani [f. pisi] common, and Thielaviopsis basicola occasionally seen.

The Gallatin Valley (Bozeman area) was hardest hit by pea Root Rot, followed by the lower Yellowstone Valley (Billings area), and the Bitterroot Valley (Stevensville area). The loss to growers in the Bozeman area is at least 40% and maybe higher. An overall estimate of 25% loss from pea Root

Rot in 1944 for the entire State of Montana would probably be conservative.

Observational evidence in some of the worst diseased areas seemed to indicate that well-manured soils will produce peas relatively free from Root Rot, despite the cool rainy weather of May and June. On the other hand, outlying areas of only fair fertility in some cases produced peas free from Root Rots. Adequate fertilization and resistant varieties appear to be the most promising control measures.

Other pea diseases of comparatively minor importance seen included Downy Mildew (Peronospora pisi), Septoria Blotch (S. pisi), Bacterial Blight (Phytomonas[Pseudomonas]pisi), and Ascochyta Blight (A. pinodella). Downy Mildew, Blotch, and Bacterial Spot were common and widespread; Ascochyta Blight was rare.

Considerable Hail damage was incurred in both the Gallatin and Lower Yellowstone Valleys. Bacterial Spot increased markedly following light hail storms. Some heavier hail storms caused complete destruction of all crops in their path. One such storm in the Gallatin Valley destroyed 513 of a total of 2300 acres being grown under contract for a canning company. -- C. M. Slagg.

PEA DISEASES IN EASTERN WASHINGTON AND WESTERN IDAHO: In Whitman County, Washington, and Lewis, Latah, and Idaho Counties, Idaho, a trace to severe injury by Frost damage resulting in a peculiar marking and deformation of the pods was seen. The epidermis on affected pods was raised and corky tissue formed underneath. In low patches in certain fields the damage would easily approach 50%. In some cases pods were merely marked, in others the peas had darkened and dried up and the pods had become puffy. Downy Mildew was prevalent, some damage being noted in a field near Uniontown, Washington. A trace of Rust [Uromyces fabae] and Powdery Mildew [Erysiphe polygoni] were noted. Sclerotinia [sclerotiorum] was seen occasionally. -- Earle C. Blodgett, July 2 - 8; 10 - 15.

CARROT DISEASES IN IDAHO IN 1943[1]

Earle C. Blodgett

Carrots have been grown in Idaho since the early days of settlement but only in home gardens and relatively small commercial plantings until just the last few years.

The fresh market carrot production developed recently in Long Valley (Valley County), near Nampa (Ada County) and Georgetown (Bear Lake County) has become an important deal. The only production figures available are as follows[2]:

Year	Acreage harvested	Acre Yield Bushel	Production Bushel
1942	300	450	135,000
1943	500	220	110,000

[1] This is a continuation, as Part 3, of the 1943 summary of plant diseases in Idaho (for Parts 1 (fruit) and 2 (onion), see PDR Suppl. 149:400-407. July 1, 1944).

[2] This information is furnished through the courtesy of the office of Richard P. Ross, Agricultural Statistician, Boise, Idaho.

These roots are harvested early (September) and undergo no storage. An unusual type of difficulty was reported in 1943 when roots grown in a certain soil type could not be satisfactorily cleaned. Particles of mica stuck to the roots and detracted from their appearance.

As early as 1924 (7) production of carrot seed in Idaho was discussed and the experimental results were very promising, but apparently little interest was taken until about 1930 when a seed company in southern Idaho wrote contracts for seed production. By 1940, in southwestern Idaho and eastern Oregon, considerable acreages were grown and expansion to new areas began. County Agent D. T. Bolingbroke, in his Annual Report for Twin Falls County in 1941, stated that several small scale trials on carrot (and other vegetable seeds) were conducted that year. According to Mr. Richard P. Ross, Agricultural Statistician, the acreage of carrot seed in 1942 was 803, with a yield of 356,935 lbs. The acreage in 1943 closely approached 2000[2]. This rapid expansion has involved nearly all the irrigated areas from Weiser, Idaho, and Ontario, Oregon, to Hazelton and Twin Falls, Idaho. Large acreages are located near Nyssa, Oregon, and Homedale, Caldwell, Nampa, King Hill, and Twin Falls, Idaho. Already such factors as isolation and rotation have become important.

Diseases affecting carrots have made their appearance and in some cases have largely limited their production. KenKnight and the writer (4) called attention to these recently and the purpose of the present paper is to add certain details gained from further disease surveys.

A. Bacterial Blight (Xanthomonas carotae): In June, 1943, KenKnight and the writer, while on vegetable and fruit work, were asked to examine the carrot seed production trials at the Horticultural Station, Parma. Injury noticeable on flower heads and stalks had been attributed to a severe freeze earlier in the season after growth had started. We did not agree with this diagnosis and pointed out that the blighting was associated with copious amounts of what appeared to be bacterial exudate. KenKnight later isolated the organism, Xanthomonas carotae, and identified the disease as a bacterial blight, probably the same as described by Kendrick (3).

This examination at Parma then led to the first reported diagnosis of bacterial blight in Idaho (4). In discussing the disease with seed company officials and field men the writer was told later, however, that the disease had been definitely noted in a field near Huston in 1940. Of special interest are the following remarks of a seed company official who kindly answered an inquiry by the writer on this particular point:

"The first time that I noted Bacterial Blight on seed fields of carrot in Idaho was in the summer of 1941. Ninety per cent of the fields inspected showed symptoms of Bacterial Blight. However, some carried only a trace, and it was necessary to inspect a good many plants before finding the disease. In other fields the disease could be picked out without any difficulty although it had not progressed to such an extent that one could stand at the edge of the fields and pick out plants in which portions of the umbels had begun to die."

It is not improbable that the leaf spotting (presumably caused by Macrosporium [Alternaria] carotae) reported by Virgin (8) was in part due to bacterial blight.

During the 1943 growing season certain fields were examined where the blight disease was very prevalent. During the fall and winter, while arranging for seed samples to be tested for seed-borne disease, special attention was directed to certain lots where yields were poor, clean-out was heavy, and germination tests were unusually low. Upon close examination of these seed samples traces to abundant amounts of the dried crystals of the bacterial exudate were found. The pieces appeared much like ground up glass and in many samples individual seeds coated with the exudate were fairly common. Many of the poor lots had been examined in the field.

Of course it is not inferred that the reduced yields, the heavy clean-out, and the poor germination of these lots can be traced entirely or even mostly to the effects of bacterial blight but there is good evidence that this disease accounted for some of the damage. The amount of exudate in seed samples could be correlated roughly with areas where fields showed heavy or light or no infection on growing crops. Since W. W. Ray and D. A. Preston in their examination of several lots of carrot seed submitted by the writer, found Alternaria radicina [Stemphylium radicinum] present on the seeds, there is some indication that this disease also may be involved in poor germination, as pointed out in a paper by Mounce and Bosher (5) who refer to work by Doyer (2) and Neergaard (6); however, no evidence of Alternaria seedling blight has been recognized in Idaho.

In the 20-acre Imperator field at Georgetown where bacterial blight was noted in September, it was seen that the disease was much more prevalent in the part of the field cropped previously to grain and potatoes than the part planted on old alfalfa land.

With the exception of this field there was no evidence of bacterial blight on the root crops (and here only on the leaves) although the disease undoubtedly was present. This seems rather surprising considering the striking injury on roots as noted by Ark and Gardner (1). These observations open up a new field for research as regards seed transmission and control measures. A summary of the tests mentioned here will be reported later in Part 8.

B. Root Storage. Since carrot roots for seed production are usually harvested and stored over winter there are opportunities for loss of roots through various types of rots. Storage conditions therefore are of great importance. Virgin (9) has pointed out some of the problems involved and suggested control measures.

During the survey activities of the past season about 25 carrot storages have been examined representing nearly all types used under varying conditions. Several hundred tons of roots were involved and storages from Pocatello to Kiser in southern Idaho and Craigmont to Moscow in the northern part of the State were examined. Without going into extensive detail and discussion of each case examined it has seemed appropriate to enumerate and discuss briefly some of the more important factors indicated by the survey. Of course, since not all factors involved, some of them highly variable, were known, and the exact influence of others was not accounted for, the conclusions are in some cases only observational in nature.

1. Sclerotinia sclerotiorum (Diagnosis confirmed by KenKnight and Ray) causes the predominant rot, a soft watery decay. Rather large, flat, round-edged or smooth sclerotia are somewhat sparingly formed on decaying

tissue and are imbedded in the mycelium. They appear as dark humps under the fungous mat. Placing S. sclerotiorum as the predominant rot-producing organism on carrots in Idaho is considerably at variance with Virgin's report (9) in which this fungus was not even mentioned.

2. Botrytis cinerea (Diagnosis confirmed by KenKnight and Ray) is next in importance. Two types may be involved. (a) Characteristically in southern Idaho the fungus sporulates rather sparing with moderate mycelial growth but produces very abundant, black, naked, rather small and rough-surfaced sclerotia. This rot often accompanies S. sclerotiorum but seems to be distinct in appearance and characteristically liberates less water and tends to mummify the roots. (b) At Moscow in northern Idaho in 4 pits representing several tons, not a single root was found rotted by S. sclerotiroum, but in one pit with roots grown on land planted to carrots the previous year, Botrytis rot was severe on about 10% of the roots. Here both sporulation and mycelial growth was excessively abundant and sclerotia were generally very scarce. The affected roots looked like pieces of gray fur.

3. Alternaria radicina [Stemphylium radicinum] (Diagnosis confirmed by KenKnight), although reported by Virgin (9) as the cause of one of the 2 predominant rots, was not noted in any lots examined by the writer except in one pit at Caldwell and one at Moscow. In these roots the infection appeared to enter mainly at the root end but entry was noted also at the crown and anywhere on the root. That Rhizoctonia may have caused some of this rot seems possible, since on one of the roots examined typical sclerotia developed. This represents the first time that Rhizoctonia sclerotia have been reported on carrot roots in the State.

In the springs of 1943 and 1944, while examining many seed fields where stands were poor, it was found that black rot apparently accounted for most of the rot occurring on the roots. It is believed that, generally, Sclerotinia and Botrytis have accounted for most of the storage rots, while Alternaria [Stemphylium] is of special importance in late season storage and after planting. Of course certain lots of roots vary in amount of initial infection and later behavior depends on effects of this factor and environmental conditions.

4. "White Spot" is a tentative term given to an apparently undescribed defect of carrot roots noted only in the pits at Moscow. (It was observed in 1942 also). Depressed areas varying in size and shape are found anywhere on the carrot and are covered with a fine white material and underlaid by very dry, darkened, rotted tissues. Indications so far are that the affected areas do not enlarge rapidly nor cause final breakdown but result in severe damage to appearance and loss in paring for table use. The condition was thought first to be a phase of Botrytis injury but no sporulation was secured in the moist chamber. The cause is not determined.

5. Erwinia carotovora, causing soft rot, was not identified in any of the lots observed in storage. Undoubtedly some occurred but it is believed that this rot was very minor this year.

C. Aster Yellows, caused by the Aster-Yellows Virus. This virus disease, recognized in Idaho in 1941 by W. J. Virgin, has become of considerable importance in seed-crop fields. As pointed out by KenKnight and the writer (4), the yellows-infected plants in the seed crop represent apparently the incidence of infection in the root crop. In all root-crop fields examined, however, only a trace of aster yellows could be suspected

except in one field. In this case, a 1-1/2 acre field of Oxheart roots grown near a heavily infected seed crop was examined on October 16. Suspected plants were chosen and pulled while the writer walked across the field, then these roots were examined closely.

The leaves of the plants were purplish and bronzed and showed numerous buds and shoots arising from the crown. In nearly all these cases the young shoots tended to turn black and die back with necrotic tips or side branches near the nodes. The youngest leaves died, giving a heart rot effect. The roots in most cases were "wooly", that is, an abundance of white fibrous roots was produced. Suspected stecklings were tested in the greenhouse and although they finally died they lived long enough to exhibit symptoms of aster yellows.

During the winter one lot of roots when sorted showed a rather high percentage of wooly roots and witches'broom tops, but when grown out in the greenhouse only some of this lot showed yellows.

Of particular interest was one lot observed in March, 1944, during sorting. These were large Chantenay roots of which many had the tops clipped very close, injuring the bud. Botrytis rot had likewise killed the center bud in many roots and numerous new shoots arose from the crown. About 15% of these had been diagnosed by inspectors as yellows-infected, but close examination and growing them out in the greenhouse showed that only a very slight infection actually prevailed.

These examples are given for 2 purposes: First, to indicate that bin or even field inspections of the root crop will not, so far as now known, give an accurate indication of the actual amount of infection by aster yellows. It is believed that late season infection on the root crop may not be visible until the seed crop is well started. Second, to show that aster yellows rapidly has become an important disease in carrot seed production, during the last 3 seasons. Observations in May 1944 showed that not until the majority of the roots had become well established, with tops 3 to 6 inches tall, did yellows-infected plants become apparent. Many die early.

Miscellaneous Observations. In one field at Twin Falls the tops of a few scattered seed heads showed a blackened condition much like mold on honey dew. The presence of aphids might account for the condition. In the same field were noted a trace of aster yellows and green dwarf, and in this and another field also a peculiar proliferation of the heads.

In one lot of carrots at North Pocatello it was noted that Sclerotinia rot, although present in the stock, was apparently much less active on second grade roots that had been washed than on unwashed roots. This observation might raise the question of the advisability of a more careful check on this problem.

A total of 22 fields (or patches) of carrots was examined and about 25 root storages. It would appear that considerable improvement in certain practices could be made rather easily and would be profitable from the standpoint of disease control. The practice of bringing in roots from other areas (out-of-state) for seed production is strongly condemned as unnecessary and dangerous from the standpoint of the whole seed industry. It is suggested that seed companies strenuously oppose this practice.

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EMERGENCY PLANT DISEASE PREVENTION PROJECT

THE SCAB DISEASE OF VIOLETS

H. H. Whetzel

The scab disease of violets, caused by Sphaceloma violae Jenkins, was studied by Massey and Jenkins in 1935 (4). They reported its destructive occurrence on the commercially grown sweet violet, Viola odorata L., in several eastern seaboard States, as well as in New South Wales, Australia. They also recorded it on pansies, V. tricolor L., as a result of artificial inoculations, and on a number of North American violets, chiefly as grown in gardens. Jenkins later reported its occurrence in South Africa (1) and still later (3) recorded additional species on which the disease had been found. Some years ago scab was discovered attacking pansies in Merchantville in New Jersey (1).

The disease first appeared in my garden, Forest Home, Ithaca, New York, on Viola jooi Janka in the summer of 1942. I had obtained seed of this beautiful southeastern European species from the garden at the Experimental Farms, Ottawa, Canada, about 10 years earlier. It throve wonderfully and until 1942 showed no trace of this disease. It seems certain that Sphaceloma violae was not introduced with the seed of V. jooi. How this pathogen gained admission into my garden I am at a loss to explain. It spread rapidly to practically all the hundreds of V. jooi plants growing in my garden during the summer of 1943. Many were killed out and nearly all the others badly deformed. Prior to 1942 I had been able to collect considerable quantities of seed of this violet from the plants in my garden for a seedsman friend. During 1943 very little seed set and matured. This species blossoms profusely early in May before the leaves develop and again somewhat less abundantly in late autumn. During the summer healthy plants produce a succession of cleistogamous flowers which were the source of my seed crop. The disease attacks the pedicels and

seed capsules most severely as well as young leaf petioles. There was abundant rain during the spring and summer of 1942 and 1943 which greatly favored the spread and activities of the pathogen.

Dr. Jenkins had visited my garden in September 1942 and collected the scab fungus on 2 or 3 other species of violet. However, the disease seemed to be restricted largely to V. jooi until this summer. We have had rains almost weekly during May and the first half of June. The growth of the many species of violets in my garden has been very rank. The scab disease is very severe and has this season developed on several other species of wild violets and on some of my pansies. It is especially severe on many plants of our native woodland Viola striata Ait. Viola jooi is again generally and destructively infected. Seedlings of this species usually suffer little the first season as the foliage is rather sparse and the plants dry quickly after rain or dew. The disease is also vigorously attacking V. palmata L, V. vilmoriniana Delacour & Mottet, V. canadensis L., V. sororia Willd., V. odorata (blue flowered), V. tricolor (wild form), V. tricolor var. hortensis, and a large flowered white violet, apparently as yet undescribed. It may be what is commonly known as V. papilionacea Pursh var. alba.

While I have not yet discovered the disease on any other species of violets in my garden, they may have thus far only escaped inoculation.

This disease is certainly a grave threat to garden-grown species of violets. It has apparently not yet been discovered affecting our northern violets growing in the wild. However, in the District of Columbia area, where there are a number of reports of the disease on wild violets growing in gardens, in a few instances it is recorded also on wild violets in their natural habitats (1, 2); the wild violet specifically mentioned (1) is Viola affinis LeConte x V. papilionacea Pursh. In New South Wales in 1936 scab was reported on the native V. hederacea Labill. growing wild (1).

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CORNELL UNIVERSITY

BRIEF NOTES, AND SOME CORRECTIONS

VIOLET SCAB IN THE DISTRICT OF COLUMBIA: Violet scab (Sphaceloma violae) appeared early in the season on both bedded and volunteer violets on my lawn in northwest Washington. Lesions were noted on leaves, petioles, and flower stalks. The trouble, which was present in 1942, and 1943, is abundant and severe, particularly on bedded plants which are being defoliated. -- H. A. Edson, July 8.

A CORRECTION: - NAME OF THE TOPSET ONION: The topset onion is Allium cepa var. viviparum, not A. fistulosum as given in the report of onion downy mildew in New York on page 519 of the June 1 issue.

A CORRECTION: - NEMATODE ON POTATO IN NEW YORK: Leon J. Tyler writes that the report of Ditylenchus dipsaci on potato in PDR Supplement 147, page 147, is an error. The nematode involved was the potato golden nematode, Heterodera rostochiensis, instead of the stem nematode, which has never been found on potato in New York.

A CORRECTION: - NAME OF THE WHEAT NEMATODE: In Dr. C. D. Sherbakoff's report in the June 22 issue, page 582, the name of the wheat nematode was given as Ditylenchus tritici, instead of Anguina tritici as it should be. As indicated by the brackets, this was an editorial error, not Dr. Sherbakoff's.

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